amounts (vide the investigations of Ledebur "Eisenhutten-kunde," Vol. IIL, p- 285, and others). If one assumes 1,300° as the reaction temperature, and uses the same figures for the specific heats as Ledebur, as well as the values previously given for the heats of combination of acids with bases, one obtains the summary given on p. 1213.

By the oxidation of the reducing agents by iron peroxide at 0°, one thus obtains with Si a not inconsiderable and with Mn a minute heat gain, and with phosphorus a heat loss, but on endowing the Fe203 with a small stock of available heat, this becomes a heat gain. Carbon, however, causes a quite considerable heat absorption. One obtains the same results by whatever method one carries out the calculations. Silicon and manganese always exhibit strongly exothermic reactions, phosphorus a feeble exothermic reaction, that is to say, they develop heat, whilst the reaction with carbon is strongly J endothermic, that is to say, absorbs much heat. From this the reagents divide themselves into two sharply characterised groups.

From the law of conservation of energy it follows that heat ' absorbing or endothermic reactions can only take place if the energy absorbed by them is replaced, and that they must cease if the supply of energy is absent, and a certain stock of energy which has been present is cut off. Inversely, it is possible that heat evolving or exothermic reactions, once instituted continue, and if the energy set free does not hinder their progress, or if in this case it is carried away, their end only occurs if inter-reacting reagents are brought to an end.

Intimate contact of the reagents is necessary to render possible the action, of iron peroxide on the reducing agents in the iron, and this condition is fulfilled by the aid of the slag, since the same dissolves iron peroxide.

The initiation of the reaction is thus provided by the slag, and the heat set free by the reaction is able with difficulty to ^ exercise a restricted influence on the continuation of the | reaction, since it is carried away by radiation and conduction, or, however, may be used up by the carbon reaction. Thus the removal of silicon, phosphorus, and manganese from molten iron must be able to result without further ado by